## REMARKS

Reconsideration of this application, as amended, is requested. In this regard, the amendment includes the environment for the decalcification method as being in whey or whey permeate aqueous solution and incorporates the subject matter of Claim 2 into Claim 1. Claims 1-14 were pending in the present application, prior to the present amendment cancelling Claim 2.

With respect to the substantive issues raised in the Office Action, Claims 1-9 and 11-14 were rejected under 35 USC 103(a) as being unpatentable over U.S. Patent No. 6,383,540 to Noel in view of U.S. Patent No. 5,443,650 to Saska et al. The Examiner identified process steps of the references that were considered to be relevant to the claims, recognizing that Noel requires the cation exchange step to be carried out before the anion exchange. Notwithstanding, the Examiner found that the order of the steps is *prima facie* obvious in the absence of new or unexpected results.

Applicant respectfully traverses this rejection.

The present claimed invention is directed to a decalcification method of an aqueous solution of whey or whey permeate comprising multivalent cations $Ca^{2+}$ and $Mg^{2+}$ and anions able to form complexes with at least a part of said multivalent cations. The method includes replacing at least a part of said anions able to form complexes of aqueous solution by monovalent anions such as $Cl^-$, non-able to form such complexes, **simultaneously with or prior to** the step of replacing at least a part of said multivalent cations of the aqueous solution by monovalent metal cations, such as $Na^+$ and/or $K^+$. The first replacing step recited in Claim 1 is performed by an anionic resin of which the counter ion is a monovalent anion non-able to form complexes with the multivalent cations. The

second replacing step defined in Claim 1 is performed with a cationic resin in which the counter anion is a monovalent metal cation.

In sharp contrast to the present claimed invention, Noel describes a method of separating out salts by transfer through electrodialysis or nanofiltration membranes which comprises, **in succession**, at least one step of exchanging divalent cations for protons and at least one step of exchanging divalent anions for chloride ions. After a portion of the cations have been exchanged for protons by percolation over a carboxylic resin, the protons are exchanged for protons by the strong cationic resin. Finally the substance is passed over an anionic resin to exchange divalent anions to chloride anions. See Noel col. 2, lines 45-61 and col. 5, line 24-col. 6, line 2 (especially line 2 of Claim 1 calling for the steps "in succession").

In such a case, where the cited reference particularly and distinctly calls for the steps to be performed in a certain order, there is no motivation for one skilled in the art to change the order of steps recited in the reference. In fact, to change the order of steps in the claimed invention against the direct teaching of Noel provides a teaching away from the reference. Therefore, the present claimed invention cannot be said to be obvious over the disclosure of Noel, since one skilled in the art would not be motivated to alter the order of the steps specifically called out by the Noel reference.

In this regard, the facts in the case of *In re Burhans*, 154 F.2d 690, 69 U.S.P.Q. 330 (C.C.P.A 1946) cited by the Examiner, are wholly distinguishable. In *Burhans*, the cited references did not affirmatively and expressly call for a particular order to the steps that the applicant was claiming. Rather, the steps were merely stated without regard to order, or were missing but considered well known in the art. In fact, the Court in

*Burhans* found that the references "clearly suggest doing the thing that the appellant has done in this case." See *Burhans* at p. 692.

In direct contravention to the finding in *Burhans*, the Noel reference unambiguously calls for a particular order to the steps. One skilled in the art, therefore, could not be said to find that Noel "suggests doing the thing that applicant has done in this case," namely to alter the express order of the steps recited as essential by Noel.

Moreover, the present claimed invention recites that processing of the aqueous solution in step (b) comprises replacement of at least a part of said multivalent cations of the aqueous solution by monovalent metal cations with a cationic resin of which the counter-ion is a monovalent metal cation. This permits the direct replacement of the multivalent cations by monovalent metal cations without the intermediary step of replacing cations with protons as called for by Noel.

Significantly, the Noel reference fails to utilize the direct cation exchange of a multivalent cation by a monovalent metal cation where Noel requires the multivalent cation be replaced by protons. See Noel, col. 1, line 66-col. 2, line 6. This is done by Noel over a carboxylic resin rather than the monovalent metal cation resin claimed herein. As such, it would not have been obvious for one skilled in the art to come up with the claimed step of the present invention, namely replacement of the multivalent cations by monovalent metal cations using a cationic resin of monovalent metal cations.

The Saska et al. reference does not cure the above deficiencies of the Noel reference. In this regard, Saska et al. relates to process for softening an aqueous sugars containing sugars and $Ca^{2+}$ and/or $Mg^{2+}$ ions with using a cation exchange resin, in the

form $Na^+$ and/or $K^+$ to give a softened sugar juice depleted on $Ca^{2+}$ and/or $Mg^{2+}$ and charged with $Na^+$ and/or $K^+$, and a further step for regeneration of said resin.

The present claimed invention relates to aqueous solutions, for the decalcification of whey or whey permeate, where the presence of calcium interferes with the concentration of the whey. The problem addressed by the invention has been to get rid of calcium and magnesium ions with a method where the formation of complexes with $Ca^{2+}$ and/or $Mg^{2+}$ ions is lowered when compared to previous methods using strong cationic resins. However, the prior art references relate to different areas. One reference relates to whey, the second reference relates to aqueous sugar juice. The common point of the references is merely the use of ion exchange resins.

The treatments described in the references do not include or suggest the method of the invention that **first** includes the replacement of anions able to form complexes by monovalent anions such as $Cl^-$, non-able to form such complexes, and **second or simultaneously** the replacement of multivalent cations by monovalent metal cations, such as $Na^+$ and/or $K^+$. Neither reference suggests that a **first** treatment by monovalent anions such as $Cl^-$ should or even could be performed. Accordingly, it is submitted that the invention defined by Claims 1-9 and 11-14 is not suggested by or even remotely hinted at by the combination of Noel in view Saska et al.

Claims 1-9, 10 and 11-14 were then rejected by the Examiner under 35 USC 103(a) as being obvious over U.S. Patent No. 4,159,350 to Jonsson considered in view of Saska et al. Applicant also traverses this rejection and requests reconsideration and removal thereof.

Jonsson relates to a method of desalination of whey, rather than decalcification, conducted through an anion exchanger and a cation exchanger. First a weakly basic anion exchanger in hydrogen carbonate form is used and then a weakly acidic cation exchanger in ammonium form is used.

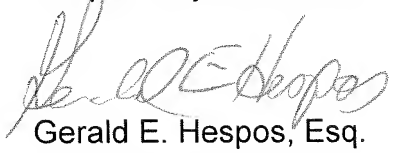
Significantly, Jonsson and Saska et al. relate to very different technological areas. The only common point between them is the use of ion exchange resins. It is submitted that the person skilled in this art and familiar with Jonsson and Saska et al. would not be led by those references to the method defined by Claims 1-9, 10 and 11-14 herein, including the order of anionic and cationic exchange discussed above. Accordingly, it is submitted that the invention defined by claims 1-9, 10 and 11-14 is not suggested by the combination of Jonsson and Saska et al., even if properly combined.

In fact, the present claimed process provides a much improved result over the processes of the prior art. Using the anionic resin in $Cl^-$ form before the use of the monovalent metal cationic resin claimed provides a low availability of exchange, presumably due to the presence of the anions, and dramatically increases softening of the whey with a favorable resin regeneration rate. The improved conditions lead to increased efficiency not provided for in the prior art.

In view of the preceding amendments and remarks, it is submitted that the claims remaining in the application are directed to patentable subject matter and allowance is solicited. The Examiner is urged to contact applicant's attorney at the number below if

there are any outstanding issues, to expedite the prosecution of this application.

Respectfully submitted,



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